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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/712,364

11/12/2003

Kazuo Kobayashi

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CHRISTIE, PARKER & HALE, LLP

PO BOX 7068

PASADENA, CA 91109-7068

EXAMINER

COLEMAN, WILLIAM D

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 08/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

A.A

**Office Action Summary**

Application No.

10/712,364

Applicant(s)

KOBAYASHI, KAZUO

Examiner

W. David Coleman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 June 2005.  
 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☒ Claim(s) 1-15 is/are rejected.  
 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) ☒ All b) ☐ Some \* c) ☐ None of:  
 1. ☒ Certified copies of the priority documents have been received.  
 2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
 \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

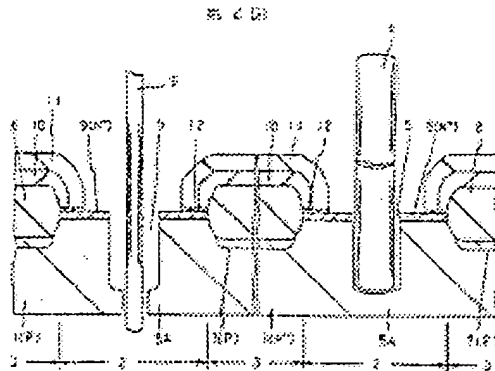
- 1) ☒ Notice of References Cited (PTO-892)  
 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date 11/03.  
 4) ☐ Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) ☐ Notice of Informal Patent Application (PTO-152)  
 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1, 7 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Shigeyuki EP 6 329 393 9.



1. Shigeyuki teaches a semiconductor process as claimed. See FIGS. 1-2, where Shigeyuki teaches the following limitations.
2. Pertaining to claim 1, Shigeyuki teaches a substrate machining method for machining a substrate, comprising:
  - cutting the substrate through a first surface by use of a rotating disk-like blade to produce a cut surface; and
  - irradiating with laser light an edge of the cut surface of the substrate, that is located in the vicinity of a second surface of the substrate, opposite from the first surface.
3. Pertaining to claim 7, Shigeyuki teaches a substrate machining apparatus for machining a substrate, comprising:

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a disk-like blade that is rotated to cut the substrate through a first surface to produce a cut surface; and

a laser light irradiating portion for irradiating a laser light to the portion, of the cut surface of the substrate, that is located in the vicinity of a second surface of the substrate, opposite from the first surface.

Pertaining to claim 15, Shigeyuki teaches a substrate machining method for machining a substrate, comprising:

cutting the substrate through a first surface by use of a rotating disk-like blade to produce a cut surface; and

Irradiating with laser light an edge of the cut surface of the substrate.

*Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3-6 and 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shigeyuki EP 6 329 393 9 in view of Mulligan et al., U.S. Patent 6,839,200 B2.

6. Pertaining to claim 3, Shigeyuki fails to teach a substrate machining method according to claim 1 or 2, wherein the laser is a YAG laser or a CO<sub>2</sub> laser. Mulligan teaches wherein the laser is a YAG or a CO<sub>2</sub> laser. In view of Mulligan, it would have been obvious to one of ordinary

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skill in the art to incorporate a YAG or a CO<sub>2</sub> laser in the Shigeyuki semiconductor process because its ablate away trenches (column 4, line 20).

7. Pertaining to claim 4, Shigeyuki in view of Mulligan teaches a substrate machining method according to claim 1, wherein a dicing tape **116** is adhered to the other surface of the substrate **114**; and

the laser light is irradiated after cutting only the substrate and expanding the dicing tape.

8. Pertaining to claim 5, Shigeyuki in view of Mulligan teaches a substrate machining method according to claim 1, wherein the laser light is irradiated onto a street that has been already formed and is different from a street being formed by cutting the substrate by the disk-like blade **117**.

9. Pertaining to claim 6, Shigeyuki in view of Mulligan teaches a substrate machining method according to claim 1, wherein the laser light is irradiated onto a street, that is being formed by cutting the substrate by the disk-like blade, while following the movement of the disk-like blade.

10. Pertaining to claim 9, Shigeyuki in view of Mulligan teaches a substrate machining apparatus according to claim 7, wherein the laser light irradiating portion is a YAG laser light irradiating portion or a CO<sub>2</sub> laser light irradiating portion.

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11. Pertaining to claims 12, and 14, Shigeyuki in view of Mulligan teach a substrate machining method according to claims 1 and 7, wherein the substrate is comprised of silicon.
12. Claims 2, 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shigeyuki EP 6 329 393 9 in view of Hwan et al., U.S. Patent 6,602,762 B2.
13. Shigeyuki discloses a semiconductor process substantially as claimed.
14. Pertaining to claims 2, 8, 10, 11 and 13, Shigeyuki fails to teach a substrate machining method according to claims 1 and 7, wherein the laser light irradiating portion irradiates the laser light onto all of the cut surface of the substrate. Hwan teaches irradiation all of the cut surface of the substrate (see FIG. 8). In view of Hwan, it would have been obvious to one of ordinary skill in the art to irradiate all of the cut surface of the substrate because the laser beam sinters the serrated edge into a smooth edge (see first sentence in abstract).

### *Conclusion*

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).
16. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. David Coleman whose telephone number is 571-272-1856.

The examiner can normally be reached on Monday-Friday 9:00 AM - 5:30 PM.

18. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

19. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



W. David Coleman  
Primary Examiner  
Art Unit 2823

WDC